QUARTERLY PROGRESS REPORT
DR-3

~~October - December 2000~~

Marshall Space Flight Center
Safety and Mission Assurance Mission Services Contract
NAS8-00179

Approved:

Randall S. Reed, Program Manager
MSFC S&MA Mission Services

January 5, 2000

Hernandez Engineering, Inc.
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1.0 INTRODUCTION

Hernandez Engineering, Inc. (HEI) successfully performed all required activities and tasks, as described in this report, in fulfillment of their Safety and Mission Assurance (S&MA) Mission Services Contract (NAS8-00179) with NASA's Marshall Space Flight Center (MSFC). This report covers a three-month period of the contract's first quarter of the first year: October 2000 through December 2000.

2.0 GENERAL MANAGEMENT

2.1 Data Requirements

The first quarter of the S&MA Mission Services contract was successfully completed on December 22, 2000. All Data Requirements (DR) Documents were submitted on or ahead of schedule throughout the quarter. They included DRD 875CD-001 On-Site Employee Location Listing; DRD 875CD-002 Security Plans for Major Applications and General Support Systems; DRD 875LS-001 Government Property Management Plan; DRD 875MA-001 Management Plan; DRD 875MA-002 Financial Management Reports; DRD 875MA-003 Progress Reports (Monthly/Quarterly); DRD 875MA-006 Operations Plan, Problem Assessment Center (PAC); DRD 875MA-007 Quarterly Open Problems List; DRD 875MA-008 Monthly Newly Opened/Closed Problem Summary; DRD 875MA-009 Personnel Training and Certification Plan; DRD 875SA-001 On-Site Safety and Health Plan; and DRD 875SA-002 Mishap and Safety Statistics Reports.

2.2 Personnel Status

(b)(4)

3.0 BUSINESS MANAGEMENT

We have experienced no financial or business management problems during this period. We attribute this to close attention to details, effective use of established controls designed to efficiently respond to program changes---both anticipated and unexpected---and the continuing support of our corporate financial group's dedicated efforts at controlling overhead expenses.

The contract continues to have a total cost underrun at the end of this period---see the December 2000 Monthly Financial Report, DRD 875MA-002, for specifics. Attachment 2, Man-Hours Expended, of this report contains a description, by major task, of the total man-hours expended this period. (b) (4)

4.0 PERFORMANCE OF WORK AND USE OF FACILITIES AND EQUIPMENT

4.1 Safety

4.1.1 Industrial Safety (IS)

The Industrial Safety (IS) group performed 15 OSHA compliance facility inspections and provided all required reports in a timely manner, this completing the CY00 annual facility inspection cycle; IS developed and submitted for QS10 approval, a comprehensive schedule of all MSFC facility inspections for CY01. This schedule identified 302 facilities for annual safety OSHA compliance inspections and 74 facilities with hazardous operations, to be inspected semi-annually. Based on a schedule of on-going construction projects provided by the Facilities Department, IS also performed 287 construction site compliance inspections to monitor adherence to OSHA and MSFC safety standards.

Among other activities, IS: (1) performed verification checks of findings reported closed by Area Managers in 16 facilities; (2) updated eight facility fire evacuation plan; (3) participated in one pre-construction conference; (4) performed five final safety inspections of facilities under renovation or construction; (5) reviewed 122 sets of facility design drawings for compliance with OSHA and consensus codes; (6) participated in one training classes to Area Managers and their assistants and provided two15 minute classes to S&MA customers; and, (7) performed 58 annual fire drills. IS continued as an active participant in weekly meetings for the proposed Propulsion Research Laboratory (PRL) to include 30% and 60% design drawing reviews with QS10, the Facilities Office, end user, and the A&E firm, Bechtel. All facility safety violations were documented in the HAZTRAK databases in order to assure MSFC's compliance with OSHA, NASA, and other consensus code requirements.

As a major significant effort, IS provided extensive support to the planning and review activities associated with the planned new Propulsion Research Laboratory (PRL). Support included: 1) Review of the second 90% Support Test Equipment Design submittal, and 2) Completed Safety Assessments for the Inertial Electrostatic Confinement Research and the Magnetic Target Fusion Plasma Gun Research to be conducted in Building 4566. Each of these experiments will eventually move to the completed PRL.

IS initiated, completed, or followed up on more than 10 facility hazard analyses. Significant activity included: (1) performed a quick turn-around Operational Hazard Analysis for the dual crane critical lift of the 250K Hybrid Motor. IS assisted Transportation, Security, EG&G, Thiokol Rocket Motor Production, and off-site contractor freight personnel perform the dual crane critical trans-load lift at Marshall Space Flight Center, and (2) safety assessments for laboratories in buildings 4549, 4566, 4655 in support of the PRL.

IS performed numerous explosives quantity-distance calculations in support MSFC. For example, IS performed a preliminary evaluation for locating a new structural test facility south of building 4674. While firm requirements for the planned facility have not been determined, this evaluation looked at the storage and use of up to one million gallons of Hydrogen. The focus was on determining if any part of the proposed facility could be located on this site for future

testing. Calculations for pressure vessel rupture and TNT overpressure calculations were made and evaluated for the site. Quantity-Distance (QD) requirements for storage from NSS 1740.12 were reviewed for the maximum storage quantity of hydrogen that could be located in this area. The documentation provided distance information for 1.0 psi and 0.5 psi overpressure in the event of a vessel rupture.

IS continued to support the implementation of the NASA lifting standard, NSS 1740.9 by providing day-to-day advice and assistance to S&MA customers. IS also administered hands-on proficiency examinations to 19 overhead-crane and 28 forklift operators in support of the MSFC Personnel Certification Program.

Note: See paragraph 4.3.2 Information Management for IS database activity.

4.1.2 System Safety Engineering (SSE)

Space Shuttle Activities. During this quarter, the System Safety Engineering (SSE) group reviewed 81 Class I change proposals for safety impact and reviewed the KSC daily problem report list each day for potential Shuttle element safety impacts. SSE supported three System Safety Review Panel (SSRP) Telecons. SSE also supported the launch preparations for STS-97, STS-98 and STS-102, including assessment of potential safety issues, participation in problem resolution, milestone discussions and STS-97 HOSC launch support. SSE has continued supporting pyrotechnic device procurement and flight certification. This involves review of pyrotechnic hardware design changes and supplier manufacturing, inspection and test documentation and pre-production and lot acceptance reviews.

Also in this period SSE completed development of the Space Shuttle Combined Risk Matrix. This is a book showing all MSFC Shuttle element hazard cause mapping with back up data from the hazards for Accepted Risk hazards. The Combined Risk Matrix was presented to the MSFC Center Director by the S&MA Shuttle Integration Representative and the SSE supervisor and was well received by the Director.

Fault Trees, Failure Investigations and Hazard Analysis. SSE completed the breakout and review of the Power-Pack Out (PPO) portion of the X-33 Engine fault tree. SSE was able to identify and make several recommendations to enhance the reliability of the PPO switchover in the event of a Power Pack Failure.

4.1.3 Payload Safety

Payload Safety completed/updated 4 safety data packages (SDP). The Deorbit Propulsive System (DPS) SDP and the Multipurpose Logistics Module (MPLM) Cargo Element Integrated (CEI) delta SDP was submitted to JSC. The DPS SDP was integrated by JSC into the X-38 SDP and the MPLM CEI delta hazard reports were signed out of board. The Integrated Rack Water Recovery System (WRS) Phase II SDP was delivered to the Interim Design Review (IDR). The Bridgman Unidirectional Dendrites in Liquids Experiments (BUNDLE) Preliminary Hazard Analysis (PHA) was completed. In addition, Payload Safety initiated a flight SDP for the Integrated Microgravity Science Glovebox (MSG) Phase III and ground SDP's for Pore Formation Mobility (PFM) and Solidification Using a Baffle in Sealed Ampoules (SUBSA) . In

addition to SDP development, Payload Safety continued development of 4 SDP's and reviewed/submitted comments for 6 SDP's.

Payload safety supported the X-37 Phase 0/1 and X-38 Phase II Flight Safety Review Panels (SRPs). The three DPS hazard reports were successfully presented to the SRP for approval. Payload safety continues completion of the Propulsive small Expendable Deployers Systems (ProSEDS) Missile System Prelaunch Safety Package (MSPSP). Payload safety supported the Flight UF-4, Window Observational Research Facility (WORF) and DPS presentations to the Marshall Payload Readiness Review Board (MPRRB). Payload safety supported and participated in SRP Special topics meetings for Candle Flames in Microgravity (CFM) II, Node 3 Environmental Control and Life Support Systems (ECLSS), and Node 2 Fire Detection and Suppression (FDS). Payload safety participated in the Preliminary Design Review (PDR) for Flight UF-4 Ground Support Equipment (GSE) and Express Pallet System. Payload safety participated in the Critical Design Review (CDR) for ProSEDS software, Small Payload access to Space Experiment (SPASE), and Dynamically Controlled Protein Crystal Growth (DCPCG) Thermal Locker. In addition, payload safety participated in the Interim Design Review (IDR) for the Water Recovery System (WRS). Over two hundred verification closures were reviewed and approved by Payload Safety for Vapor Compression Distillation (VCD) Flight Experiment (FE).

The Kit for the External Repair of Module Impact (Kermit) S&MA plan was updated by Payload Safety Payload Safety reviewed and provided comments to the Interim Control Module (ICM) S&MA plan. In addition, Payload safety participated in the following technical meetings: Oxygen Generation Assembly (OGA) Oxygen Hazard Analysis at White Sands Test Facility, MPLM Flight Acceptance Review (FAR), Vapor Compression Distillation (VCD) Flight Experiment (FE) pre-ship review, and the Nodes Quarterly Review. In addition, Payload safety provided support during the Flight 3A mission.

4.2 Reliability

4.2.1 Reliability & Maintainability (R&M) Engineering

R&M's support to QS10 during this reporting period included analyses on a number of technical issues including the following: evaluation of the demonstrated reliability and Quantitative Risk Assessment System (QRAS) results of all SSME configurations and comparisons of their reliabilities at different power levels; Single Flight Reliability calculations for High Pressure Fuel Turbopump/Alternate Turbopump (HPFTP/AT) regarding high vibration levels during testing; and providing data to update the Space Shuttle Program upgrades team analyses to reflect the risk reductions of the Space Shuttle due to in-work and proposed upgrades, with reductions being based on QRAS models. R&M calculated the probability of a Space Shuttle catastrophic failure during the period of 25 seconds after liftoff based on QRAS results. R&M provided support to the SSME Advanced Health Management System (AHMS) upgrade Independent Assessment (IA) review regarding the quantitative risk assessment that was performed by Rocketdyne to calculate predicted risk reductions based on QRAS. R&M also updated the Statistical Evaluation of Shuttle Launch History Report, which is now current through the last launch. R&M participated in a 4-day training course for the Probabilistic Risk Assessment (PRA) training tool, SAPHIRE (Systems Analysis Programs for Hands-On Integrated Reliability Evaluations), which has been declared by NASA to be the standard

software tool for performing PRAs in the future. R&M personnel continue to finalize the models of the Space Shuttle Quantitative Risk Assessment for delivery.

In the payloads & space station area, R&M is in preparation of the Node 2 FMEA to support the DR2 review. For the ICM project, preparations have been made to finalize the ICM FMEA to concur with the ICM standby configuration. R&M continued to work on the MSRR-1 FMEA and Reliability analysis to be submitted at the upcoming CDR. R&M provided input into redefining the reliability requirement for the MSRR-1 project. R&M provided a status and summary of the FMEA and Reliability & Maintainability analyses for the MSRR-1 S&MA design audit. Also initiated work on the MSRR-1 Master Controller Reliability prediction according to MIL-HDBK-217.

In support of the SSME, R&M met with the Boeing-Rocketdyne at the Canoga Park, California facility to test the electronic FMEA system that is in development. In support of the testing process R&M assisted in locating four "Bugs" within the systems processes and made approximately 30 suggestions for improvements to the system that had been overlooked during the systems initial development.

In support of the SRB project, R&M provided QS20 support for a cable anomaly investigation when it was discovered the B1103 SRB side NSI on the LH lower strut failed to fire during separation of STS-97. R&M also provided QS20 support of Electronic and Integration anomaly team for a capacitor in a Command Receiver Decoder (CRD) that failed thermal testing. In addition, R&M provided support for the closure and investigation of CAR's involving ground support for United Space Alliance (USA).

In support of the QS20/External Tank Office, R&M participated in a Preliminary Design Review/Certification Design Review (PDR/CDR) at the Michoud Assembly Facility (MAF) for the Al 2219 Domes and Forward Ogive during mid-October. Comments were issued and addressed by R&M during the review. Also, R&M continues to review and support the Friction Stir Weld process as it transitions from the PDR (Sept. 2000) to CDR (Scheduled June 2001).

In support of X-Vehicles, R&M is currently developing a FMEA/CIL(s) for the Electrical Interface Panel (EIP) and the De-orbit Propulsion Stage (DPS) Separation Bolt Retractor Assembly to be used on the X-38/DPS. Additionally, R&M developed a fault tree on the X-38 DPS depicting events that could contribute to loss of the Attitude Control System.

Also, in support of QS10/Industrial safety, R&M developed Failure Modes And Effects Analyses (FMEA) documentation for Hoists RR327 and RR328 located in Building 4619.

4.2.2 Problem Assessment Center (PAC) Operations

HEI's PAC personnel processed and coordinated disposition of problem reports, supported launch preparation milestones, coordinated the MSFC Problem Assessment System, and operated the Corrective Action System (CAS). The PAC received and entered 27 new problem reports (PRs) into MSFC's Problem Reporting and Corrective Action (PRACA) System, coordinated MSFC interim closure of 28 PRs, received 26 prime contractor closure recommendations, supported MSFC full closure of 26 PRs, and performed 133 individual PR

database updates and reviews. We conducted 8 SSME problem review boards, which dispositioned 25 of 25 problem reports presented. The SSME PAC reviewed problem trends and generated or updated 22 trends for problems newly opened or submitted for disposition.

The PAC supported 14 pre-launch milestones for STS-92, STS-97, STS-98, and STS-102 in addition to coverage of 5 Level A launch attempts (4 for STS-92 and 1 for STS-97). This included providing open problems listing and counts, real-time meeting support, and/or issue analysis on open MSFC PRACA critical problems. In support for the launch attempts, we extracted and provided copies of KSC PRACA problems as they were entered at KSC for MSFC S&MA review during Level A countdown, and instructed the HOSC on use of the KSC PRACA system.

In problem system coordination, the PAC facilitated MSFC review and closure of 6 of 10 remaining IUS problems, clarified processing and obtained Project Manager closure concurrence for most historic ICM problems, revised problem reporting requirements for GP-B at the request of the Project Manager, reviewed and itemized deficiencies in using the existing contractor system for X-34 PRACA processing, drafted a letter from the SRB Project Manager to his prime contractor directing accelerated full problem closure submittals, . The PAC also expedited MSFC review and disposition of RSRM, SRB, and SSME problems in close proximity to scheduled launches. We also participated in user testing and System Readiness Review of the Shuttle Program Office/USA WebPCASS CIL and Waiver applications and participated in review of the SSME e-FMEA and e-Hazard systems. In relationship to the Shuttle Program Office's PRACA Evaluation Team (PET) activities and Revision H to NSTS 08126, "Shuttle PRACA Requirements," we participated in this quarter's PET telecon (resulting in closure of 5 of 7 previous MSFC actions), worked 2 new actions regarding training (by researching current PRACA training activities and developing a syllabus and training charts for a winter course on MSFC PRACA) and getting "current version" of NSTS 08126 into prime hardware developer contracts (by drafting a letter specifying that requirement to S&MA to coordinate with MSFC Shuttle Project Managers). We also generated a processing and screening flow for PRACA processing based on Rev. H, evaluated RSRM prime contractor compliance with Rev. H, and participated in discussions with Thiokol on our evaluation and their responses.

The PAC provided problem data from specific SSME hot fire tests, of spreadsheets and listings of SSME problems on requested topics, and to JSC SIAC on SRB APU problems. These were in addition to regular monthly reporting of newly opened/newly closed MSFC PRACA problems and new opened shuttle element PRACA problems for presentation to the Human Exploration and Development of Space, quarterly generation of the Open Problems List, daily distribution of KSC Shuttle PRACA problems and the report from MSFC's resident office at KSC, daily maintenance of the Open Against Next Mission problem summary available on the web, and generation of various ad hoc reports on problem system activity.

In implementation and operation of the MSFC CAS, we received 17 potential CAS reports, screened 25 draft Recurrence Control Action Requests (RCARs), and initiated 6 RCARs. We received 16 responses from laboratory points of contact with either disposition rationale or response extension requests. We coordinated Corrective Action Board review of 11 RCARs, resulting in full closure of 9 RCARs. We also provided open RCAR status reports and

discussion at the ISO Implementation Team and Focus Team meetings, prepared charts and supported discussion of CAS activities at the December MSFC Quality Council, and issued monthly RCAR status and delinquent response reports. We corrected data, revised/clarified processes (including revising and obtaining approval for Revision C to S&MA OI QS10-R-005, "Failure Reporting and Corrective Action System"), submitted results, and obtained MSFC approval for closure of 2 nonconformance reports (NCRs) resulting from the August, 2000 NQA surveillance audit. We further attended OPR training and impacted 5 QS10-controlled MPGs and MWIs for changing from ISO 9001:1994 to ISO 9001:2000. In compliance with Contract Metric B.1.f (Element #6), we screened all draft RCARs within the 5 workday requirement, averaging 4.37 calendar days from receipt to screening for the quarter.

4.2.3 ALERT Program

HEI's ALERT support included both regular and special activities as we coordinated MSFC ALERT processing. HEI received 21 ALERT notifications, distributed 21 ALERT announcements for MSFC review, and obtained 316 responses from MSFC project, contractor, and laboratory contacts. We queried local and remote ALERT data systems and provided information on a chair design safety concern, DFP hypalon paint, a Boeing SCAN, and specific ALERTs during launch imminent mode. We assisted development and submittal of MSFC's Annual GIDEP Utilization Report and participated in discussion of ALERT processing at the S&MA Deputy Director's QS10 RADAR metrics briefings and with S&MA project representatives regarding in-house processes. We also made final preparation for implementation of the MSFC ALERT web-based notification and response system, which was delayed by priority adjustments from MSFC S&MA. Due to this system not being in place, we requested and obtained QS10 concurrence to delay implementation of schedule performance contract metric B.1.d Real-Time ALERT Availability (Element #4) until its implementation

4.3 Quality Assurance

Quality Engineering (QE) personnel performed follow-ups on the National Quality Assurance (NQA), USA, nonconformance reports (NCRs) resulting from the third and fifth surveillance audits of MSFC. Two NCRs have been closed. One generic NCR generated by MSFC as a result of the third surveillance audit remains open. QE participated in revision of documents, Directives Control Board (DCB) reviews, and resolution of comments for other Directives revised during this period

External Tank (ET) Quality engineering participated in the Al 2219 domes and forward ogive combined PDR/CDR held at Michoud Assembly Facility. Quality engineering also participated in the discussions to assist in identifying inconsistencies and inadequacies in the ET Verification Plan and provide recommendations for revising the plan to adequately identify requirements for verification of all ET hardware.

SSME/AT hardware and software Quality Engineering provided support for pre-test planning sessions, post-test data reviews and all technical discussions related to extended development testing of Block II Engine 0525. Additional testing of E0525 and HPFTP/AT unit 11 was necessary to evaluate potential long term affects of high turbine end 2E vibration levels, to

determine the cause of the 2-3 diffuser cracks discovered in post hot-fire teardown Certification hardware.

SRB Quality Engineering participated in a United Space Alliance (USA) process review at Hamilton Sundstrand. The purpose of this review was to provide an assessment and positive assurance that all USA SRB hardware designs, material and processing changes accomplished on SRB hardware are appropriately identified and communicated to the SRB Element. SRB Quality engineering also participated in an anomaly investigation of a possible through crack, found in STS-101 Check Valve and Filter Assembly (CVFA). The anomaly team developed a plan of action, which included performing dye penetrant inspection and destructive analysis of the housing.

Payloads Quality Engineering personnel developed a Quality Assurance Program Plan for the Glast Burst Monitor Project. QE also evaluated and provided recommended changes to the X-37 Quality Plan submitted by the X-37 contractor.

QA continued surveillance of MSFC test areas by reviewing documentation, monitoring test activities and performing inspections.

4.3 Information Management (IM)

Information Management (IM) provided significant support to application development projects during the quarter. IM incorporated enhancements, including the designee function and multiple roles, to the Supervisor Safety Web Page (SSWP) application. Cron jobs to maintain current SSWP personnel data were set up on the development server and the application was deployed for beta testing. IM wrote an Organization Administrator and a Supervisor User Guide and deployed them on-line with the application. In addition, IM held two SSWP Organization Administration training sessions. IM also gathered requirements for the next phase of SSWP development.

The web-based "ALERTS Tracking System" (ALERTS) application was deployed on the S&MA production web server (msfcsma1) and released for use. Alerts is a notification, tracking, and response data system that will be used by MSFC personnel, including the Alert evaluator, reviewer and contractors, to respond to ALERT issuances.

IM also made significant progress on Radar application development. Administrative functions were incorporated into the web interface program. The blue function was revised to reflect activity within the current reporting period to assist the users. IM investigated options for optimizing the application and incorporated some improvements that resulted in a significant improvement in application response time. Radar was also redesigned for efficient history functionality. Access to Radar was provided for an LaRC user, and a description document was developed and provided.

IM assisted S&MA in verifying accurate and complete part number entry into the As-Built Configuration and Status System (ABCSS). During the verification process, IM was also performing an in-depth analysis of system interface and efficiency. As a result, ABCSS was revised to resolve a problem with entry of multiple part tags, and some data was corrected.

Other development activities included revision of the Virtual S&MA site to populate project pull-down lists from a database and to assure availability of web pages for all S&MA supported projects. IM assured that warning banners are properly applied in all applications. A review meeting was also held to assure acceptable design of the Inventory of Hazardous Operations (IHOPS) application; requirement revisions were gathered.

All S&MA major application security plans were updated and outstanding items were identified. IM also peformed a study of the shared S&MA space and will recommend reorganization methods in January, 2001. IM also conducted a study of potential development products; a recommendation of development products will also be submitted in January, 2001.

4.5 Human Exploration and Development of Space (HEDS) Assessment

4.5.1 International Space Station (ISS) Independent Assessment

During this period, the HEDS Assurance Group Independent Assessment (IA) Team completed one ISS assessment and initiated another, provided key participation in the IA Systems, Operations, and Mission Integration Teams, participated in other ISS Program meetings and special teams, researched and updated HEDS IA risk items, and reviewed past findings for closure.

The completed assessments was "Urine Processor Assembly Interim Program Review." The assessment initiated was "Pressurized Element On-orbit Depressurization Response." The final report for the completed assessment is in process. Observations from these assessments are being documented and presented via the HEDS IA Office to the ISS Program Office for their review and attention. Additional topics have been briefed to the HEDS IA Office as potential assessments.

A number of Engineering Information Reports (EIRs) were prepared and delivered in response to emergent and short-notice requests for information by the HEDS IA Office. In addition, group personnel are assigned as Interim Control Module, Multi-Purpose Logistics Module, Propulsion Module HEDS IA flight specialists.

4.5.2 Space Shuttle Independent Assessment

During this period, the HEDS Assurance Group Independent Assessment (IA) Team completed one Shuttle assessment: (1) "Remote Operated Fluid Umbilical Operations and Safety Requirements." Final observations and recommendations from this assessment were forwarded to the Flight Projects Directorate. Because the Space Shuttle Program Manager has requested strong involvement by the HEDS IA organization in the Shuttle Upgrades Program, Group personnel have been heavily involved in HEDS IA support and four Group members appointed as points of contact for propulsion related upgrade projects are participating in their respective Integrated Product Teams. Regular reports in the form of stoplight charts and supporting information are provided to the project managers and the HEDS IA Office. An MSFC HEDS IA Team senior consultant has been assigned and participates in Shuttle Upgrades Program Management forums.

4.6 Project Assurance

HEI Project Assurance (PA) personnel supported COFR/Launch Activities and participated in assessments of flight readiness for STS-92, STS-97, STS-98 and STS-102. The assessments included the ET/SRB Mate Milestone Review, element Pre-Flight Assessments (PFA), Pre-flight Assessment Reviews (PAR), Flight Readiness Review (FRR) Tagups and L-2 Tagups. HEI personnel also supported the Technical Issues Briefings to the Center Director for STS-97 and participated in Huntsville Operations Support Center (HOSC) launch support for STS-92 and STS-97.

HEI PA participated in each of three Gravity Probe B (GP-B) Monthly Program Reviews held at Stanford University (SU). PA reviewed and provided comments on the SU Risk Management Plan and participated in several test readiness reviews held at SU and Lockheed Martin. PA supported the move to the experiment from the clean room to the lab and reviewed Probe/Dewar insertion procedures for adequacy and content. PA also participated in the Gas Management System Repair Review at SU and in a Safety TIM at SU.

HEI PA assisted in the development of the United States Propulsion System Segment Specification and the Prime Item Development Specification (PIDS) for the Node 4 and Propulsion Module. Also, assisted in the development of the Statement of Work (SOW) and the Data Requirements for the Segment Specification, Node 4 and Propulsion Module.

HEI PA traveled to KSC to assist MSFC Resident Management Office S&MA personnel in assessing the Quality Escapes for the MSFC Space Shuttle elements. The quality escapes for the months of August through December were completed.

4.7 Risk Reduction/Management Support

HEI instructors have taught the Continuous Risk Management (CRM) course to MSFC projects eight times in the reporting period. The instruction includes a presentation of CRM principles the first day. The second day a workshop is held and the project personnel, with the assistance of the instructors, develop a risk baseline for the involved project.

5.0 COST REDUCTION ITEMS

Our continuing cross-utilization of employees, continuous analysis of work in progress to assure that application of resources meets the needs of the task, and the judicial acquisition and distribution of tools to enhance the efficiency of all team members allow us to minimize cost to the customer.

6.0 SELF ASSESSMENT OF PERFORMANCE

A. Schedule Performance

a. Submittal of Data Requirements (DRs)
   i. DR 875MA-002 Financial Management Report (533M)
   Status: HEI has delivered three monthly 533M reports on schedule.
   ii. DR 875MA-003 Progress Reports
   Status: HEI has delivered three Monthly Progress reports on schedule. HEI has delivered one Quarterly Report on schedule.
   iii. DR 875MA-007 Quarterly Open Problem List
   Status: HEI has delivered one Quarterly Open Problem List on schedule.
   iv. DR 875MA-008 Monthly Newly Opened/Closed Problem Summary
   Status: HEI has delivered three Monthly Newly Opened/Closed Problem Summary reports on schedule.
   v. DR875SA-002 Mishap and Safety Reports
   Status: HEI has not had a Mishap (A, B, or C), Incident or Close Call during this reporting period. HEI has submitted three monthly MSFC Form 4371s on schedule.

b. Personnel Certification
   Status: There have been no certifications expire or lapse during this reporting period. HEI has acquired new certifications for new employees.

c. Safety Compliance and Hazardous Operation Inspections
   Status: HEI developed a comprehensive schedule approved by the customer / QS10 for facility inspection. HEI inspections during this reporting period have been timely and in accordance with schedule criteria.

d. Real-time ALERT Availability
   Status: HEI has distributed all ALERTS in a timely manner in accordance with criteria.

e. Audit Action Item Status
   Activities for this task have been minimal. There have been no audit actions items to track.

f. Recurrence Control Action Request (RCAR) Status
   Status: HEI has screened 25 RCARs and generated 6 RCARs during the reporting period. All were generated in a timely manner (less than 5 days).

g. Safety and Environmental Inspection
   Status: HEI has met the Safety and Environmental worksite inspection criteria. All supervisors have conducted monthly worksite inspections.

B. Cost Performance
   Status: HEI's first quarter actual composite direct labor rate incurred (calculated at the fully burdened level) was (b)(4) versus the (b)(4) contracted rate. This metric is measured annually for cost performance and is subject to fluctuation.

C. Safety Lost Time Incident (LTI)
   Status: HEI has incurred no LTIs during this reporting period.